

Appl. No. 10/018,659  
Reply to Office Action of September 11, 2003

**REMARKS**

Claims 1-20 are presently pending. In this response, claims 1, 8, 9, 11 and 17 are amended. Careful reconsideration in view of the following remarks is most respectfully requested.

**Rejections Under 35 U.S.C. 112, First Paragraph:**

In paragraph 2, claims 1-7, 9-12, 15, 17-18 and 20 were rejected under 35 U.S.C. 112, first paragraph, as allegedly having "no support" for certain limitations. These rejections are most respectfully traversed, as follows.

First, in response to the objections to the language "well over about 0.1%," while it is submitted that there is support for this language, perhaps the language "well over" may not be as desirable a term. Accordingly, the language is amended to be along the lines of the language as originally filed. It should be appreciated that the broadest range of protection should still be available under the doctrine of equivalents because this language is essentially returning language previously removed (i.e., thus, the original claim language is not further amended). At this time, the original claim language is also slightly cosmetically amended in a manner that should not affect the broadest reach of the claims under the doctrine of equivalents.

Second, in response to the objection to the language "0.145%," it is respectfully submitted that this was a typographical error that is now corrected to read "1.45%." As should be understood, this is clearly supported in the original disclosure, such as, e.g., at page 7, line 4.

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Third, in response to the objection to the language "0.4%," it is respectfully submitted that this language is fully supported in the original disclosure. See, e.g., page 5, line 24 (example with 0.42%), page 6, line 8 (example with 0.45%), and page 1, line 11 (above about 0.1%), and page 4, line 1 (up to about 2%). It should be clearly understood based on the present disclosure that the content can vary in some examples from about 0.1 to 2%. The values .42% and .45% are clearly **about** .4% and, further, the disclosure provides clear support that the value can be anywhere in the range of .1 to 2% in some embodiments. Accordingly, the disclosure provides clear support for above "about 0.4%" as recited in certain claims.

Withdrawal of these rejections is most respectfully requested.

**Rejections Under 35 U.S.C. 102:**

In paragraph 4, claims 8, 13, 14, 16 and 19 were rejected under 35 U.S.C. 102(b) over Kanakawa, et al. These rejections are most respectfully traversed, as follows.

First, to begin with it is respectfully noted that some preferred embodiments of the invention can enable the manufacture of high strength steel structural parts, such as, e.g., steel having a high carbon content, by pressing and sintering. In these instances, the process can, thus, be simpler and more economical than previously possible. On the other hand, Kankawa merely relates to a powder injection molding binder which is purported to be a new polymer having specific properties which are enumerated in column 4, for the purpose of producing complicated shapes.

Second, as the Patent Office has again relied upon the Kankawa reference, the Patent Office's careful attention to the previously filed remarks is most respectfully requested, which remarks are incorporated herein by reference.

Third, in order to assist the Patent Office's appreciation of some of the differences between the process Kankawa and the processes used in some of preferred embodiments of the present invention the following comments are now provided. The following remarks are generally provided to facilitate the Examiner's appreciation and should not be construed as being intended to further define and/or limit the scope of the invention as claimed, nor to limit the broadest reach of the claims under the doctrine of equivalents.

In this regard, Kankawa involves a powder injection molding composition containing at least 10% of an allegedly inventive polymer (I) plus at least 10% of a binder auxiliary (II), with the rest being a powdery material. That composition is injected into a mold and allowed to harden, without pressing. Then, it is heated to remove the binders. The product obtained, which apparently has a density based on the powdery material of, roughly estimated, 60%, is then sintered.

On the other hand, in preferred embodiments described in the present application (i.e., this description is not meant to limit the scope or interpretation of claims), a metal powder is mixed with an aqueous solution of 0.5-2.5% by weight of a hydrocolloid, such as, e.g., gelatin, forming a pasty mixture which is granulated by being passed through a sieve and then dried. In preferred embodiments, these granules of agglomerated powder are poured into a mold and pressed under high pressure to a green body which is then heated to remove the non-carbon content of the

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binder. In preferred embodiments, this green body, which has a density of 80-90%, based on the metal powder, is then sintered into a very dense product.

Fourth, claim 1, as now amended, recites, among other things, "pressing an agglomerated spherical soft iron-based powder containing about from 0.5 to 2% by weight of a thermo-reversible hydrocolloid as a binder to a green body." In view of the foregoing, discussion, it should be readily apparent that the references do not teach or suggest the combinations of features recited in claim 1.

It is respectfully noted that the limits recited in the claims find clear support in the present disclosure. In this regard, the Patent Office's attention is directed to the above remarks and also to some of the following illustrative limits discussed in the present specification at the below-noted pages.

<u>Limits</u>	<u>Specification Pages</u>
2% by weight of a hydrocolloid	page 3, line 27
0.1% carbon	page 1, line 11
>0.5% carbon + graphite	page 4, line 19
0.42% carbon	page 5, line 24
0.45% carbon	page 6, line 8
1.45% carbon	page 7, line 4

Fifth, claim 13, as previously presented, recites, "[a] method for making a high strength steel part from a soft iron-based powder, comprising: **mixing** a soft iron-based powder with a thermo-reversible hydrocolloid binder into an agglomerated powder, said hydrocolloid binder acting as a means to add carbon to the powder, **pressing** said

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agglomerated powder to a green body, **heating** the green body to a temperature of about 450-650°C under a protective atmosphere that prevents oxidation to remove the non-carbon content of the binder substantially, and **sintering** the green body at a temperature of about 1100-1400°C to create a structural part of high strength."

Emphasis added for reference. As per the above, the cited reference does not teach or suggest the features recited in this claim.

Sixth, claim 19, as previously presented, recites, "[a] method for making a high strength steel part by **simple pressing and sintering of metal powder**, comprising: **mixing** an agglomerated powder having a soft iron-based powder and a binder that acts as a means to add carbon to the powder, **pressing** said agglomerated powder to a green body, **heating** the green body under a protective atmosphere that prevents oxidation to remove the non-carbon content of the binder substantially without removal of carbon content, and **sintering** the green body to create a structural part of high strength." Emphasis added for reference. As per the above, the cited reference does not teach or suggest the features recited in this claim.

Accordingly, it is respectfully submitted that independent claims 1, 13 and 19 should be allowable. The remaining claims depend directly or indirectly from respective said independent claims and, thus, should also be allowable. In addition, the dependent claims recite additional non-suggested combinations of features. Independent consideration of each dependent claim is respectfully requested.

Withdrawal of the foregoing rejections is, thus, most respectfully requested.

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**Informal Rejection of Claim 3:**

In paragraph 5, the Patent Office informally commented on claim 3 without expressly reciting a rejection related thereto. The Patent Office's informal remarks regarding claim 3 are respectfully traversed, as follows.

First, the Patent Office is most respectfully requested to clarify the statutory basis for this informal rejection. Based on the Patent Office's remarks, it is not clear if the Patent Office considers claim 3 to lack novelty under 35 U.S.C. 102 (see, e.g., Patent Office remark "the limitation to the graphite is still disclosed as follows") or to be obvious under 35 U.S.C. 103 (see, e.g., Patent Office remark "[i]t would have been obvious ..."). It is most respectfully submitted that if the Patent Office decides to issue a formal rejection of claim 3 that such rejection be made non-final. Additionally, the undersigned respectfully traverses the Examiner's remark that "[i]t is common knowledge in the prior art [to] add graphite to steel powders to be sintered **in the same field of [the] invention ...**" It is respectfully submitted that – at least in the context of the present invention – such is not within the knowledge in the common knowledge. Should the Examiner desire to maintain this position, it is most respectfully requested that a suitable reference be found or that this position be properly withdrawn.

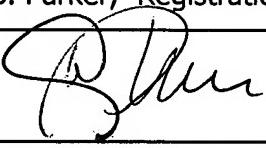
Second, it is most respectfully submitted that the Patent Office has improperly overlooked the features recited in claim 3. Among other things, the features recited in claim 3 can help enable the obtaining of "a sintered product having a carbon content above about 0.5%" as recited in dependent claim 8. It is respectfully submitted that the Patent Office has improperly passed over the features recited in claim 3, and

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additionally, the combination of features recited in dependent claim 8. In this response, claim 8 is amended so as to depend from claim 3, rather than claim 1. This amendment is submitted because claim 8 is considered to be in a preferred cosmetic form in this manner and the Patent Office's appreciation of some potential advantages of the recitations in claim 3 are better highlighted in this manner. It is submitted, however, that – as should be understood – claim 8 was already allowable and, hence, all of the elements in claim 8 as now amended should receive a full and non-limited range of equivalents under the doctrine of equivalents.

**Concluding Remarks:**

In view of the above amendments and remarks, early reconsideration and allowance are respectfully requested. In the event that any fees are due in connection with this filing, please charge our Deposit Account No. 02-2135.

RESPECTFULLY SUBMITTED,					
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